Polarimetric and Interferometric Synthetic Aperture Radar ; a new way to quantify three-dimensional structure of Earth and planetary surfaces (Pol-InSAR)
Completed Technology Project (2011 - 2012)

Project Introduction

The PolInSAR technique is designed to greatly improve estimates of forest biomass and ecosystem 3D structure . This application is also of special interest in the study of permafrost and analogs of planetary surfaces using radar. We will develop a new estimation technique to quantify three-dimensional radar scattering mechanisms using Polarimetric and Interferometric Synthetic Aperture Radar (PolInSAR) measurements with GSFC's newly developed DBSAR and later ECOSAR.

This study will employ a three phased approach: SAR image formation and calibration. DBSAR polarimetric and interferometric data analysis. PolInSAR algorithm development, validation and extension.

Anticipated Benefits

This project benefits NASA EcoSAR IIP project and future airborne and spaceborne POLInSAR missions.

Primary U.S. Work Locations and Key Partners
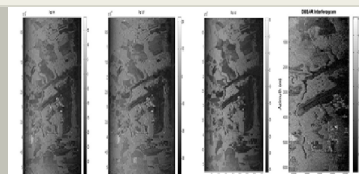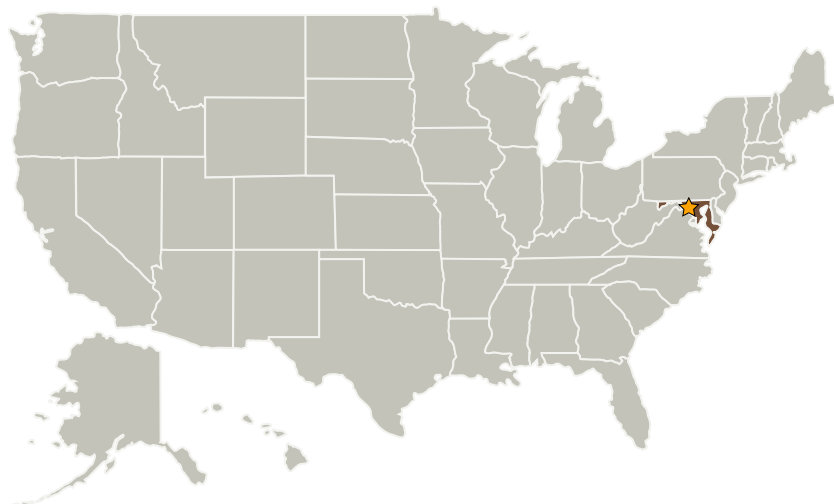
Left to Right. Polarimetric (HH, VV, HV) and single pass Interferometric DBSAR images over WFF, VA. Data acquired during the successful 2011 Eco3D airborne campaign.

Project Image ROE FY12 CIF 351 ES Polarimetric and Interferometric Synthetic Aperture Radar (Pol-InSAR); a new way to quantify three-dimensional structure of Earth and planetary surfaces

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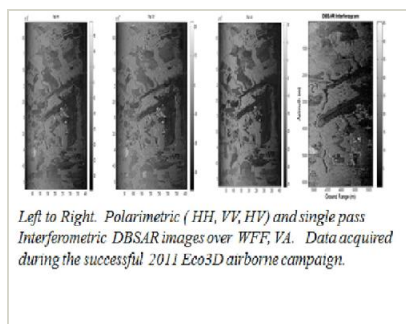Completed Technology Project (2011 - 2012)

Organizations Performing Work	Role	Type	Location
⭐Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
University of Maryland-College Park(UMCP)	Supporting Organization	Academia	College Park, Maryland

Primary U.S. Work Locations
Maryland

Images

Left to Right. Polarimetric (HH, VV, HV) and single pass Interferometric DBSAR images over WFF, VA. Data acquired during the successful 2011 Eco3D airborne campaign.

77.jpg
Project Image ROE FY12 CIF 351 ES Polarimetric and Interferometric Synthetic Aperture Radar (Pol-InSAR); a new way to quantify three-dimensional structure of Earth and planetary surfaces *(https://techport.nasa.gov/image/1169)*

Project Website:

http://sciences.gsfc.nasa.gov/sed/

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Center / Facility:
Goddard Space Flight Center (GSFC)

Responsible Program:
Center Innovation Fund: GSFC CIF

Project Management

Program Director:
Michael R Lapointe

Program Manager:
Peter M Hughes

Project Manager:
William E Cutlip

Principal Investigator:
Jon K Ranson

Co-Investigators:
Lynn M Carter
Temilola E Fatoyinbo Agueh
Rafael F Rincon
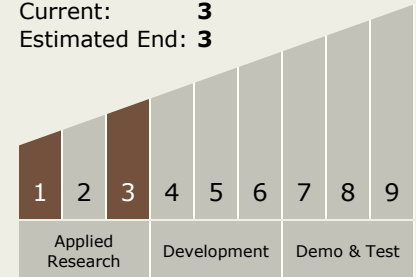Nargess Memarsadeghi

Center Innovation Fund: GSFC CIF

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Technology Maturity (TRL)

Start: **1**
Current: **3**
Estimated End: **3**

1	2	3	4	5	6	7	8	9
Applied Research			Development			Demo & Test		

Technology Areas

Primary:

- TX04 Robotic Systems
  └ TX04.1 Sensing and Perception
    └ TX04.1.3 Onboard Mapping and Data Analysis

TechPort

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For more information and an accessible alternative, please visit:
https://techport.nasa.gov/view/10550

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